Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: May 2004

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. The monthly reports summarizing channel water salinity conditions are submitted for October through May of the following calendar year in accordance with SWRCB requirements. Conditions of channel water salinity in the Suisun Marsh are determined by specific electrical conductivity and specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

This report is required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	Northern Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

In addition, data from the stations listed below are also included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area precipitation, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on condition that may affect channel water salinity in the Marsh.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of May, 2004, salinity conditions at all five compliance stations were in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of May was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for the eastern and western compliance stations was 11.0 mS/cm during May 2004. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is as shown below.

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

Delta outflow for this month varied from a low 9,197 cfs to a high 14,882 cfs as shown in Figure 3. Outflow started off low, about 12,000 cfs and peaked to a high 14, 882 cfs on May 12, 2004. The increase was a result of upstream releases intended for meeting Delta salinity standards. Thereafter outflow declined and continues to do so for the remaining month. During this month, only one precipitation event occurred on May 28, 2004.

The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for May is listed below:

Month	Mean NDOI (cubic feet per second)
May	11,986

2.3 Rainfall

For the month of May, only one precipitation event occurred. It resulted only 0.05 inches of precipitation. Overall, there were very small amount of precipitation activity this month.

Total monthly rainfall at the Waterman Gauging Station in Fairfield during May 2004 is listed below:

Month	Total Rainfall (inches)
May	0.05

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock configuration at the SMSCG from December 15, 2003 through end of May 2004 are summarized below.

Period	Gate status	Flashboards status	Boat Lock status
December 15, 2003 to May 12, 2004	3 gates open	Installed	Closed
May 13 to May 31, 2004	3 gates open	Removed	Closed

Due to low salinity levels throughout the marsh in May 2004, the flashboards were removed on May 13, 2004 and gate operations ceased for the remaining control season ending on May 31, 2004.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

Due to low outflows (i.e. less than 15,000 cfs) in May 2004, salinity levels at all compliance and monitoring stations increased the first half of May and stabilized during the second half of the month. Despite the increase, salinity levels at both compliance and monitoring stations remain remarkably low and meeting the monthly standard of 11.0 mS/cm was not of a concern. As a result, the flashboards were removed and gate operations ceased on May 13, 2004 due to low salinity levels throughout the marsh. Salinity levels at all compliance stations were below 6.0 mS/cm, and at monitoring stations, the salinity levels were below 8.0 mS/cm throughout May.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for May 2004 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations were similar to that of May 2001, but with slightly lower magnitude. Comparing to the previous nine years (i.e. 1995 – 2003), the following observations are made for each of the stations salinity levels for May 2004:

- C-2 salinity level was similar to that of 2002 and third highest
- S64 salinity level was fourth highest
- S49 salinity level was similar to that of 2001 and fourth highest
- S42 was the same as 2002, and was the second highest
- S21 was the same as 2002, and was the third highest
- S97 was the third highest
- S35 was the second highest

Overall, May 2004 salinity levels were ranked second in past nine years in terms of high Specific Conductance.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

May 2004

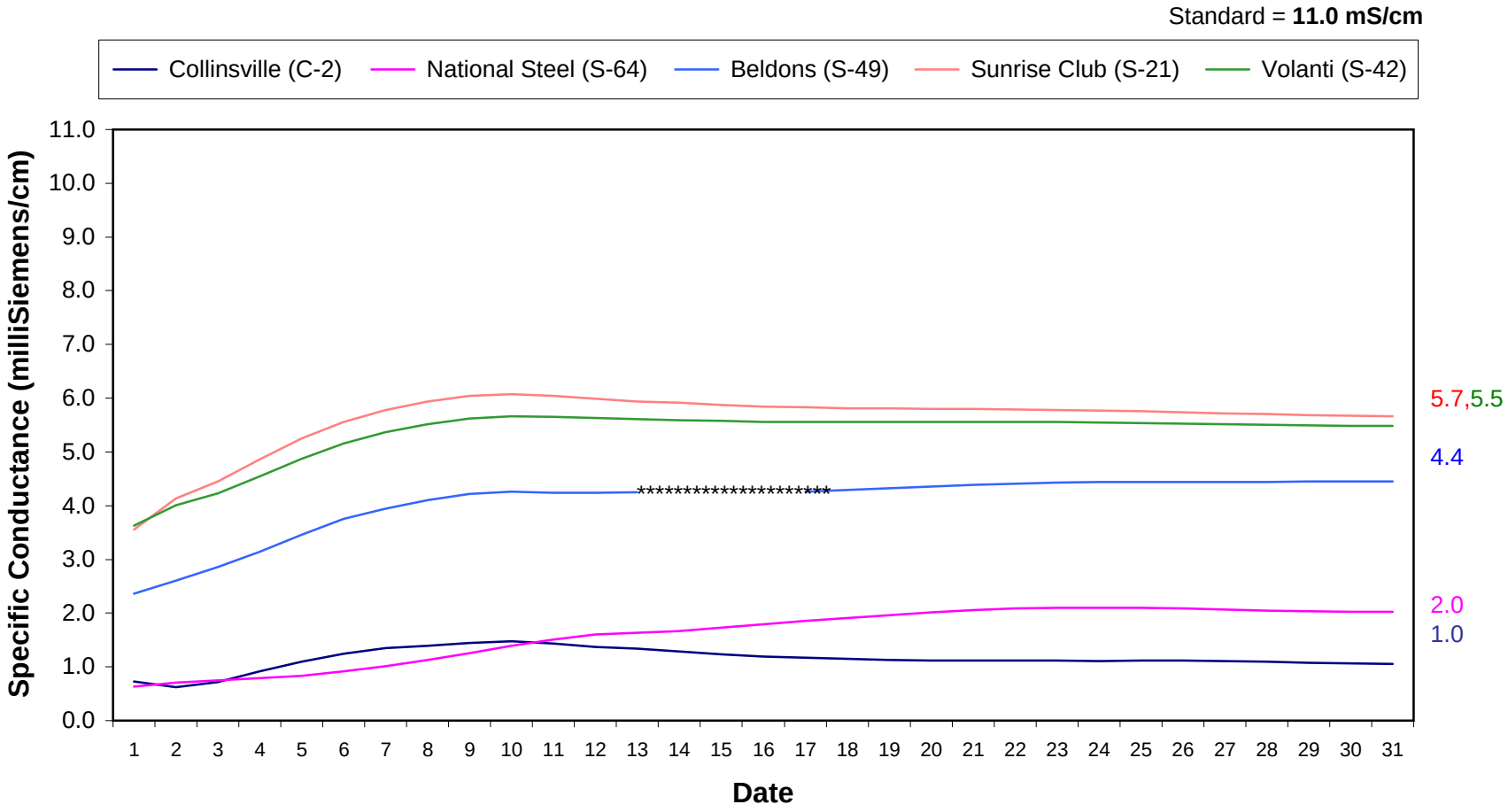
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	1.0	11.0	Yes
S-64	2.0	11.0	Yes
S-49	4.4***	11.0	Yes
S-42	5.5	11.0	Yes
S-21	5.7	11.0	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

*** This value was calculated based on available data from May 1 through 13, 2004 and May 17 through 31, 2004. The data series from May 14 through 16, 2004 was not available due to equipment failure.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance May 2004



********** Missing data due to equipment failure.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
May 2004

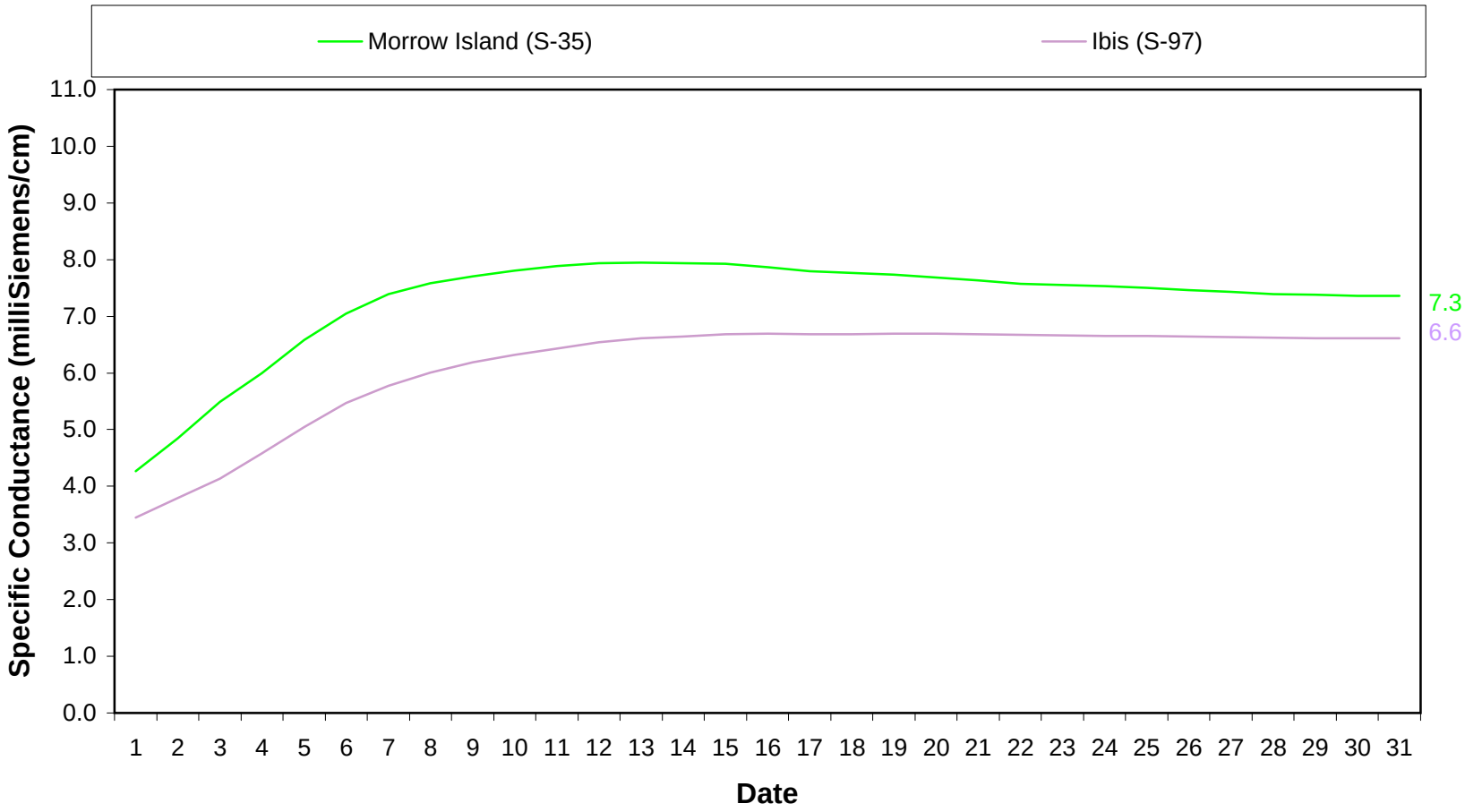
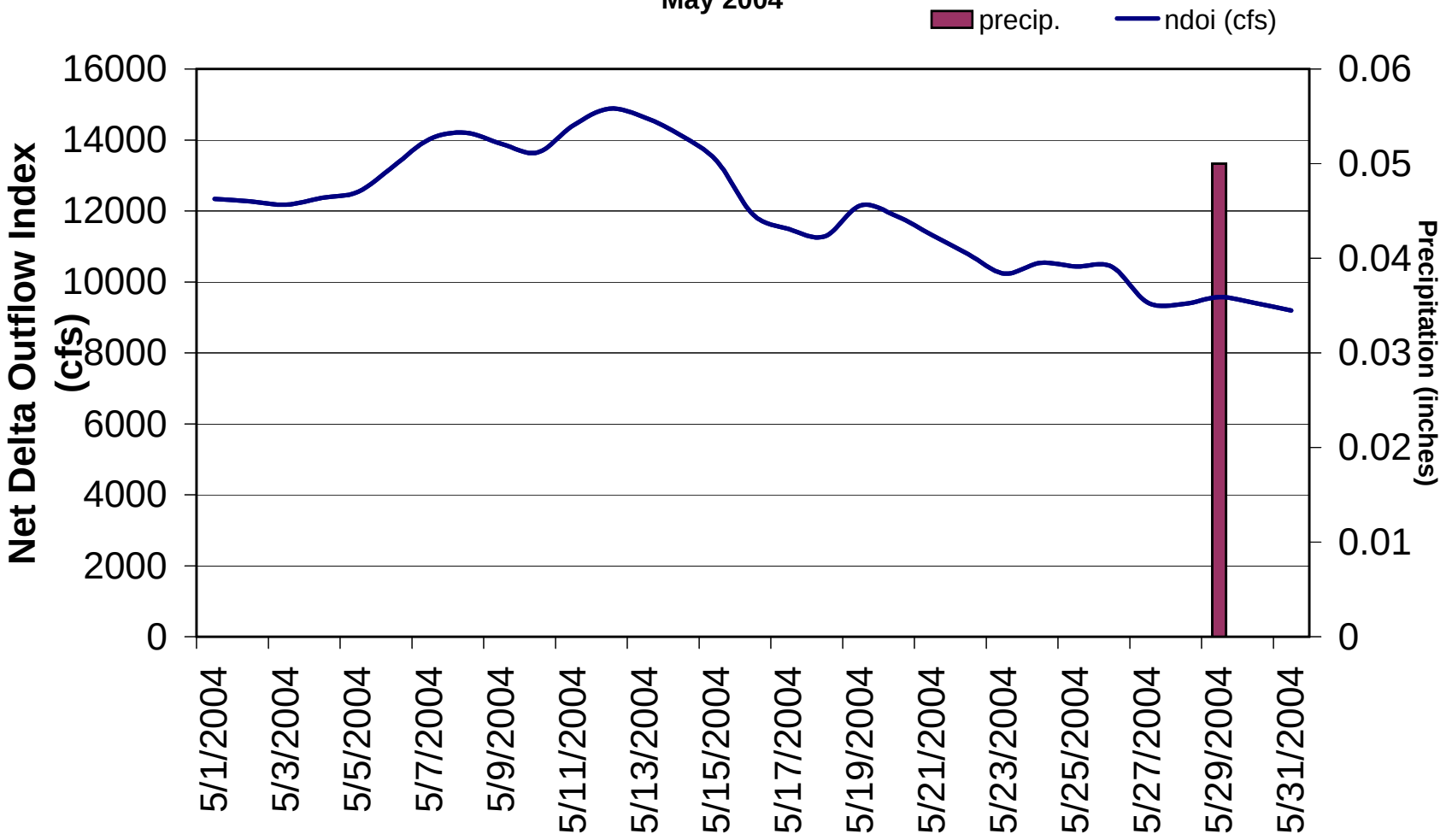


Figure 3. Daily Net Delta Outflow Index and Precipitation*
May 2004



*Preliminary DWR, O&M data

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations May of 1995-2004

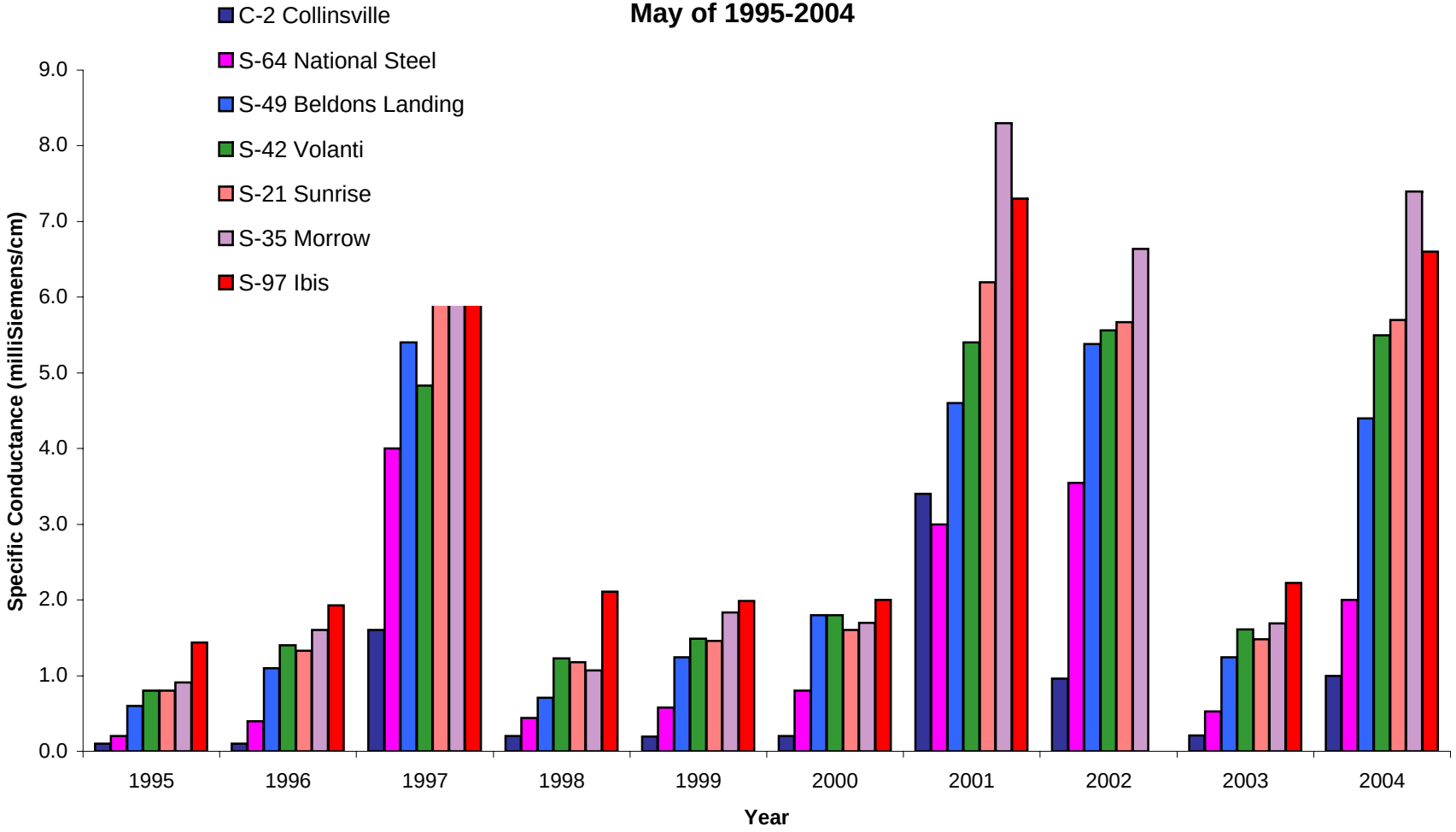
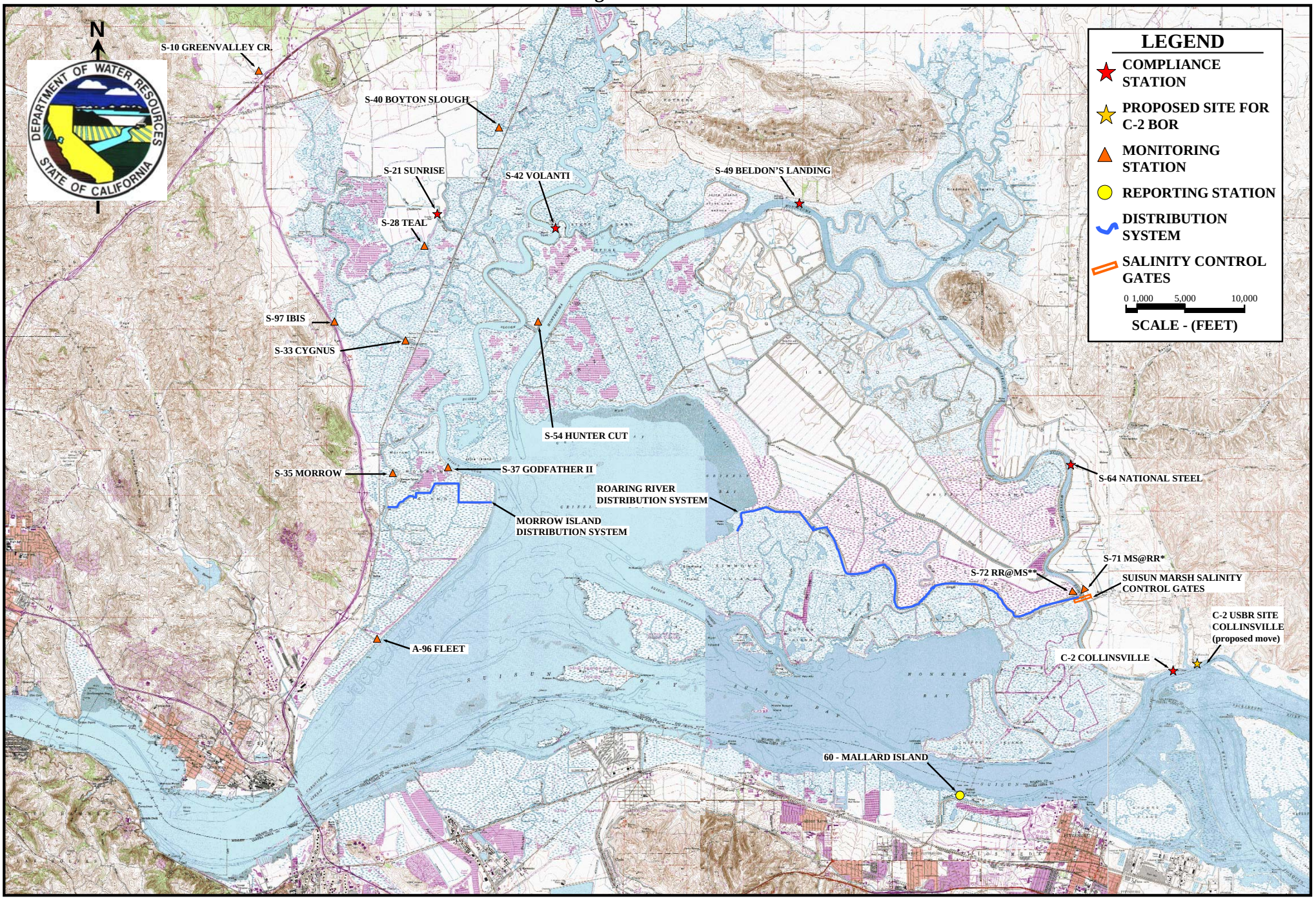


Figure 5



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES